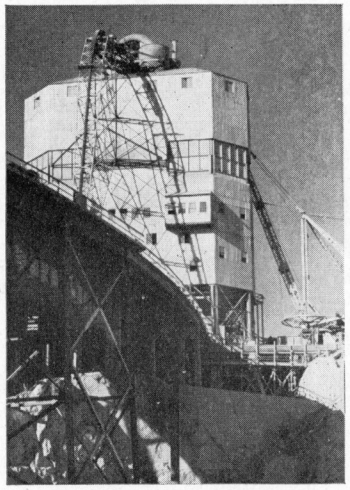
Engineers Used X-Ray to Test All Steel Welding

NO LITTLE effort and time went into the preparation of the actual dam site for construction. As the excavation was getting under way, about 33,000 feet of diamond drills were put down into the granite foundation on which the dam rests. These drillings varied on occasion from 660 to 880 feet. This action was necessary for the engineers to determine the strength of the rock foundation. Further drilling determined that the bedrock was of a uniform character.

Millions of years ago, as the earth's formation was taking place, cracks and crevices developed when the molten rock solidified and shrunk. It became, as a consequence, the work of the engineers on Grand Coulee Dam to seal these fissures with a grout of cement and water which was forced down through the holes drilled into the rock. Five rows of such holes, 30 feet deep and 20 feet apart, alternately were drilled under the upstream side of the dam and completely across the canyon. Under pressure, the grouting then took place to prevent future leaking. Into each detail of the construction has gone the painstaking foresight which has made the finished project everything desired by man. It was with certainty that each huge bucket with its mixture of cement, water, gravel, and sand which went into the forms, that each piece of steel making up the fabrication of the bulwark and each welding job had been tested for perfection. No doubt can exist as to the structure of the materials which, combined, formed the pile of masonry that today is backing up the waters of the mighty Columbia River.



Precision Device Used

To determine the certainty of the welding of the steel, X-ray photographs of each phase of the work were provided the engineers. The all-seeing device was maintained on the job and immediately the photograph was taken, experts processed it, and the result was made available to the responsible engineer. No portion of the work was cleared for future action until every minute element of precision had been exhausted.

In just as determined a manner, a check was made upon every bucket of concrete which was carried to the puddlers at work in the forms, during the day or under the artificial illumination of a myriad of electric lights flooding the construction work from sunset until sunrise. There could not be the possibility of a "weak" bucketful of the mixture going into the dam. If the checker, who stood behind the mixing man in the magic tower controlling this phase of the activity, questioned the figures turning up on his automatic signal board, the bucket was dumped and a new weighing-in begun. Every yard of the mixture going into the growing slab had to meet the specifications to assure a near-perfection in the completed job.